

TROUBLESHOOTING GUIDELINES

This appendix brings together all the troubleshooting guidelines covered in the text and is designed to serve as a central point of reference when you are solving computer problems. The appendix is divided into sections by topic to help you locate information, but when you are not certain of the source of the problem, try browsing through the entire appendix, which may help you identify the source of the problem you are addressing. The suggestions made here are only meant to be summary guidelines. See the related chapters for complete explanations and procedures.

The following table is a detailed index to this appendix, listing the problems you may find yourself solving. It indicates both where in the appendix you can find troubleshooting guidance, and which chapter in the book contains more details about how to solve the problem.

If you find items in these guidelines that need to be updated, visit the Course Technology Web site at www.course.com/pcrepair to submit an item to be included in future versions of the guidelines.

CAUTION

Don't open your computer's case until you read this warning. Removing, replacing, and modifying pieces of hardware inside your computer without following the necessary precautions can cause you and your computer serious damage. The most common risk to a computer is posed by the discharge of static electricity, which can destroy circuit boards and chips. However, accessing the insides of the power supply or monitor can pose serious safety risks to you as well. These dangers can be avoided. To ensure safety in your work setting, follow every precaution listed in the Read This Before You Begin section at the beginning of this book.

Description of Problem	Appendix E Page	Chapter Reference
The computer does not boot	E2	2 (boot process); 12 (software problems under Windows 9x); 13 (software problems under Windows NT); 14 (software problems under Windows 2000)
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The Computer Does Not Boot

Recall that the startup BIOS first performs POST before it turns to secondary storage for an OS. During POST, errors are communicated as a series of beeps, called beep codes, until video is checked. After video is running, errors are displayed on the screen. When POST completes with no errors, it sounds a single beep indicating all is well. Below is a list of the various ways things can go wrong between power on and a successful boot.

Blank screen, the PC appears “dead”

- Are there any burnt parts or odors?
- Are there any loose cable connections?
- Is the computer plugged in?

- Are all the power switches turned on? Remember to check the computer, the monitor, the surge protector, and the uninterruptible power supply.
- In some cases, a PC may appear to be dead because of a bad monitor. If you hear a single beep, can see lights on the front panel, and can hear a spinning hard drive, check for a bad monitor or a faulty monitor connection.
- Is there a separate circuit breaker that should be checked?
- Is the wall outlet (or surge protector) good?
- If the fan is not running, turn off the computer, open the case, and check the connections to the power supply. Are they secure? Are all cards securely seated? Are there any loose parts inside the case or on the system board?
- In some cases, a PC may appear to be dead because of a bad monitor. If you hear a single beep, see lights on the front panel, and can hear a spinning hard drive, check for a bad monitor or a faulty monitor connection.
- For an ATX system board, there is a wire that runs from the power switch on the front of the case to the system board. This wire must be connected properly, and the power switch on the front of the case must be turned on before the power comes up. This wire and its system-board connection might be labeled “REMOTE SW,” “PWR SW,” or something like that.
- Remove memory modules and reseal them. For a DIMM, try a different memory slot.
- Check the voltage output from the power supply. (How to do this is covered in Chapter 11.)
- Blow out the dust from the power supply’s fan vent. Excessive dust causes overheating.
- Remove all nonessential expansion cards (modem, sound card, mouse) one at a time. Verify that they are not drawing too much power and pulling the system down. It is possible that the expansion cards are all good, but that the power supply is not capable of supplying enough current for all the add-on boards.
- It may be that there are too many cards and the computer is overheating. The temperature inside the case should not exceed 113° F.
- Trade the power supply for one you know is good. For AT system boards, be certain to follow the black-to-black rule when attaching the power cords to the system board.
- Is there strong magnetic or electrical interference? Sometimes an old monitor will emit too much static and EMF (electromagnetic force) and bring a whole system down.
- If the fan is running, reseal or trade the CPU, BIOS, or RAM. A POST code diagnostic card is a great help at this point.
- Sometimes a dead computer can be fixed by simply disassembling it and reseating cables, adapter cards, socketed chips, and memory modules. Bad connections and corrosion are common problems.

- Check jumpers, DIP switches, and CMOS settings.
- Is the system in a Doze or Sleep mode? Many “green” systems can be programmed through CMOS to suspend the monitor or even the hard drive if the keyboard and/or CPU has been inactive for a few minutes. Pressing any key will usually resume exactly where the user left off.
- A dying or dead battery may cause problems. Sometimes, if the computer hasn’t been used for a few days, a weak battery will cause the CMOS to forget its configuration.
- Use a POST code diagnostic card to check system-board components.
- Exchange the system board, but before you do that, measure the output voltage of the power supply in case it is producing too much power and has damaged the board.

The computer does not recognize all installed RAM or SIMMs

- Are CMOS settings correct?
- Run diagnostic software such as PC-Technician to test memory.
- Are DIMM or SIMM modules properly seated?
- Look for bent pins, or chips installed the wrong way, on cache memory. Look for loose memory modules.
- Place your fingers on the individual chips. Sometimes a bad chip will be noticeably hotter than the other chips.
- Make sure the DIMMs or SIMMs have the correct or consistent part number. For example, if there are four installed SIMMs, they usually must be the same size (in megabytes) and same speed (in nanoseconds).
- Replace memory modules one at a time. For example, if the system only recognizes 6 out of 8 megabytes of RAM, swap the last two SIMM modules. Did the amount of recognized RAM change?
- Use SIMM modules with the same part number. (See Chapter 4 for details.)
- A trace on the system board may be bad. If this is the case, you may have to replace the entire system board.

Error messages appear during booting

- When a PC boots, one beep after POST indicates that all is well. If you hear more than one beep, look up the beep code in Appendix A.
- If error messages appear on the screen, then video is working. Look up the error message in Appendix A if you don’t understand it.
- If a problem arises during a soft boot, try a hard boot. A soft boot may not work because TSRs are not always “kicked out” of RAM with a soft boot, or an ISA bus may not be initialized correctly.

- If new hardware has just been installed, disconnect it. If this solves the problem, troubleshoot the new device.
- For Windows 9x, try to boot into Safe Mode.
- Boot from a floppy disk. You should boot to an A prompt. If you are successful, the problem is in the hard drive subsystem and/or the software on the drive.

After booting from the floppy drive, consider the following:

- Can you access the hard drive from the A prompt?
- If you can get a C prompt, then the problem is in the software that is used on the hard drive to boot, such as the partition table, Master Boot Record, operating system hidden files, or command interface files. See the suggestions for hard drive problems.
- Run diagnostic software (Nuts & Bolts or PC-Technician) to test for hard drive hardware problems.
- Open the case, check all connections, and reseal all boards.
- Reduce the system to essentials. Remove any unnecessary hardware, such as expansion cards, and then try to boot again.

Windows 9x does not load correctly

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- Boot into Safe Mode and then try booting normally. While in Safe Mode, if any changes were made in Control Panel just before the problem occurred, undo the changes.
- Boot from a rescue disk and run a current version of antivirus software.
- For Windows 98, use the System Configuration Utility to troubleshoot the load process. For more information, see Chapter 12.
- Try booting from the Nuts & Bolts rescue disk.

Problems after the Computer Boots

- If you suspect that software may be the source of the problem, try diagnostic software such as Nuts & Bolts Disk Tune or ScanDisk before reloading the software package.
- If you are having a problem with a hardware device, suspect the applications software using the device. Try another application or reinstall the software.
- If you suspect that hardware is the source of the problem, first isolate the problem by removing devices and substituting good components for suspected bad ones, one at a time. Be aware that the problem may be a resource conflict.
- Check the voltage output from the power supply with a multimeter.
- Check jumpers, DIP switches, and CMOS settings for the devices.
- Suspect a corrupted device driver. Reinstall the driver.

Memory Problems with DOS

A TSR will not load high

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- Are all command lines present in CONFIG.SYS and AUTOEXEC.BAT?
- Make sure that the DEVICEHIGH= commands in CONFIG.SYS are ordered so that the larger TSRs are placed first in the larger UMBs. There may not be enough upper memory addresses available to load the last ones.
- Try using MEMMAKER, which does a very good job of choosing the best order of loading TSRs.
- Some TSRs do not work from upper memory, so test them before assuming that all is well.

A device does not work or the system hangs

When a device doesn't work, suspect a resource conflict that may cause a device to stop working or the system to hang. Some common ones include:

- Two expansion boards are using the same I/O address, upper memory addresses, IRQ, or DMA channel.
- DOS has created and is using a UMB in the same memory addresses used by an expansion board, causing a memory conflict.

Two expansion boards are using the same resource

- Use MSD or Device Manager to determine what resources are being used.
- Some devices display the resources they are using during the boot process. Carefully watch for this information during booting.
- Read the documentation for each board to determine what resources are used and to look for the possibility of using alternate resources.
- Some expansion boards have DIP switches or jumpers that allow you to substitute one set of resources for another. Change the settings to avoid the conflict.
- For a memory address conflict, you may change the memory addresses by adding a parameter to the command line that loads the device driver for the expansion board.

When UMBs and expansion board memory addresses conflict

- Read the documentation for each board, use MSD or Device Manager, or watch for the displayed information while booting to determine the upper memory addresses in use.
- Use the Exclude option to the EMM386.EXE command line. For example, to exclude CC000–CFFFF from the addresses used by UMBs, use this command line:

```
DEVICE=C:\DOS\EMM386.EXE NOEMS X=CC00 - CFFF
```

- Reboot your computer to activate the change. For more information on memory address conflicts, see Chapter 4.

Power Supply Problems

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Symptoms of problems with the power supply or the house current to the PC are:

- The computer stops or hangs for no reason. Sometimes it may even reboot itself.
- During booting, the system might hang, but after several tries, it boots successfully.
- During booting, beep codes occur, but the errors come and go.
- Memory errors appear occasionally.
- Data is written incorrectly to the hard drive.
- The keyboard stops working at odd times.
- The system board fails or is damaged.
- The power supply overheats and becomes hot to the touch.

Try these things:

- What other devices are using the same house circuit? Remove a copy machine, laser printer, or other heavy equipment from the circuit.
- Measure the voltage output of the power supply, or exchange it for one you know is good.
- Install an electrical conditioner to monitor and condition the voltage to the PC.

The fan on the power supply stops working

Usually just before a fan stops working, it hums or whines. If this has just happened, replace the fan or the entire power supply. If you replace the power supply or fan and the fan still does not work, the problem may not be the fan or power supply. It may be caused by a short somewhere else in the system drawing too much power. This section is about troubleshooting a short somewhere else in the system.

- Don't operate the PC with the fan not working. Computers without cooling fans can quickly overheat and damage chips.
- Turn the power off and remove all power cord connections to all components, including power to the system board, and all power cords to drives. Turn the power back on. If the fan comes on, the problem is probably with one of the systems you disconnected, not with the power supply.
- Turn the power off and reconnect the power cords to the drives. If the fan comes on, you can eliminate the drives as the problem. If the fan does not come on, try one drive after another until you identify the drive with the short.
- If the drives are not the problem, suspect the system-board subsystem. With the power off, reconnect all power cords to the drives.

- Turn the power off and remove the power to the system board by disconnecting P8 and P9 or P1. Turn the power back on.
- If the fan comes back on, the problem is probably not the power supply but a short in one of the components powered by the power cords to the system board. The power to the system board also powers interface cards.
- Remove all interface cards and reconnect plugs to the system board.
- If the fan still works, the problem is with one of the interface cards. If the fan does not work, the problem is with the system board or something still connected to it.
- Check for missing standoffs that may be allowing a system-board component to improperly ground to the computer case.
- Look for damage on the bottom side of the system board that may be causing shorted circuits on the board.
- Frayed wires on cable connections can also cause shorts. Disconnect hard drive cables connected directly to the system board. Power up with power to the system board connected, but all cables disconnected from the system board. If the fan comes on, the problem is with one of the systems you disconnected.
- Never replace a damaged system board with a good one without first testing the power supply. You don't want to subject another good board to possible damage.

Floppy Drive Problems

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Below is a list of errors you may encounter, created by floppy drive problems.

General failure reading drive A: Abort, Retry, Fail?

The problem may come from several sources, including:

- An error in the application you are currently running
- The operating system you are currently running
- The system BIOS or CMOS setup (they may not be correctly configured)
- The floppy disk in the drive
- The floppy drive
- The floppy drive controller card
- The cable from the controller card to the drive
- The power supply
- The power supply cable to the drive (it may be loose or disconnected)
- The command just issued (it may contain a mistake or may be the wrong command)
- The drive latch (it may not be closed, or the disk may be incorrectly inserted)
- The drive read/write head (it may be dirty)

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Try the following:

- Remove the floppy disk. Does the shuttle window move freely?
- Do you see any dirt, hair, or trash on the disk's Mylar surface?
- Does the disk spin freely inside the housing cover?
- Some new disks simply need a little loosening up. Put the disk back in the drive and try again.
- Does the light on the correct drive go on when you try to access it? Maybe you are trying to access the B drive, but the disk is in the A drive.
- Will another disk work in the drive? If so, the problem is probably caused by the disk, not the drive. There is an exception to this statement. The drive may be out of alignment. If it is, the drive will be unable to read a floppy disk formatted in another drive that has a different (correct) alignment, although it may read a disk that is formatted with its own alignment. To test this possibility, try several disks, and note if the drive only reads those disks that it has recently formatted. If so, then you've probably located the problem. You probably will want to replace the drive.
- Does the drive light come on at all? If not, then the problem may be with the software or the hardware. Try to access the disk with a different software program.
- What does work? Can DOS access the drive with a simple DIR A:? Can File Manager or Explorer access the disk? How about CHKDSK A:?
- Reboot the machine and try again. Many problems with computers disappear with a simple reboot. If a soft boot doesn't do it, try a hard boot.
- If the light doesn't come on even then, suspect that the source of your problem is the power to the drive or the hardware connections inside the case.
- Does a second floppy drive work? If both lights refuse to come on, suspect the power supply or the floppy drive controller card.
- Has this drive been used recently? Perhaps the system setup has lost CMOS data. The system may think it has a 720K drive when it really has a 1.44-MB drive. Access Setup and check the drive specifications.
- Try cleaning the drive's read/write heads. Use a head-cleaning kit that includes a paper disk and a cleaning solution.

If none of the above solves the problem, it is time to go inside the case. Turn off the computer and open the computer case.

- Check every connection from the system board to the drive.
- Check the power cable connection.
- If the drive uses a controller card, remove the card. Using a clean white eraser, erase and clean the edge connector and reseal the board.
- Take the power cable from a second, working floppy drive and put it on the non-working one to eliminate the power cable as the problem.

- Replace the data cable and try the drive again. Exchange the controller card. If that does not work, exchange the drive itself and try again.
- If the drive still does not work, suspect the system board or the ROM BIOS on the system board.

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3.1**Non-system disk or disk error. Replace and strike any key when ready**

This error message appears when you are booting from a disk that does not have the operating system on it. Use a different disk and try to boot again.

Invalid or missing COMMAND.COM

This error message appears when DOS is loading and the two hidden files are present, but COMMAND.COM is not present, is corrupt, or is the wrong version. Boot from a bootable disk that has COMMAND.COM, and then copy the file to the disk that you want to be bootable or use the SYS command to restore the file.

Invalid Drive Specification

This error message appears when you are trying to access a drive that the operating system does not know is available.

Not ready reading drive A: Abort, Retry, Fail?

This error occurs when the disk in drive A is not readable. Maybe the disk is missing or is inserted incorrectly. The disk may have a bad boot record, errors in the FAT, or bad sectors. Try using Nuts & Bolts to examine the disk for corruption.

Track 0 bad, disk not usable

This message typically appears when you are trying to format a disk using the wrong disk type.

Write-protect error writing drive A:

This error occurs when the disk is write-protected, and the application is trying to write to it.

Problems with the Mouse**A⁺CORE**
2.1**The most common problem created by the mouse: the cursor on the screen is difficult to move with the mouse**

The rollers inside the mouse housing collect dirt and dust and occasionally need cleaning. Remove the cover to the mouse ball from the bottom of the mouse. These usually come off with a simple press and shift motion. Clean the rollers with a cotton swab dipped in a very small amount of liquid soap.

Hard Drive Problems

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When troubleshooting hard drive problems, always begin by interviewing the user, asking questions such as the following:

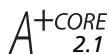
- Was the computer recently moved?
- Was any new hardware recently installed?
- Was any new software recently installed?
- Was any software recently reconfigured or upgraded?
- Does the computer have a history of similar problems?

Below is a list of hard drive problems you may encounter while supporting PCs.

Hard drive does not boot

This error may occur for any number of reasons. Try the following:

- Confirm that both the monitor and computer switches are turned on.
- Prepare for the presence of a virus by write-protecting your bootable rescue disk. Then try booting from this boot disk and logging on to drive C. If you have a Windows 9x rescue disk, you can use ScanDisk, Chkdsk, or Fdisk to examine the system.
- If the PC will not boot from the bootable floppy disk, verify that the boot disk is good. Try using it in a different computer.
- After booting from the rescue disk, run a current version of an antivirus program.
- Check to be sure that the power cable and disk controller cable connections are good and are correctly oriented.
- If the drive still does not boot, try performing the following procedures in order:
 - Reconnect or swap the drive data cable.
 - If the drive uses an adapter card, reseal or exchange it.
 - Exchange the hard drive with one you know is in working condition, and try to boot from that.
- A bad power supply or a bad system board also may cause a disk boot failure. If the problem is solved by exchanging one of the above modules, try reinstalling the old module to verify that the problem was not caused by a bad connection.
- For DOS, boot from a floppy disk, run SCANDISK, and restore hidden system files on drive C with the command: A:\>SYS C:.
- Boot from the Nuts & Bolts rescue disk.
- Check CMOS setup to confirm that BIOS recognizes the drive.



Drive retrieves and saves data slowly

This may be caused by fragmented files that have been updated, modified, and spread over different portions of the disk. Run DEFRAG to rewrite fragmented files to contiguous sectors.

- Verify that the hard disk drivers are properly installed.
- If the PC uses disk caching software, verify that it loads and is operational.
- Use a current version of anti-virus software to check for viruses.

Computer will not recognize a newly installed hard disk

If the disk is brand new or has no information you want to keep on it, consider the following:

- Does the hard disk manual state that you must first do a “low-level” format or run Disk Manager before using the disk? IDE drives are already low-level formatted. Older drives require the user to perform this task.
- Has the FDISK utility been successfully run? Choose Display Partition Information from the FDISK menu to verify the status.
- FORMAT C:/S is the last required “format” step. Has this been done?
- Has the CMOS setup been correctly configured?
- Verify in CMOS setup that power management features are disabled.
- Verify that the drive spins up when power is turned on.
- Are there any drivers to install?
- Are there any DIP switches or jumpers that must be set?
- Has the data cable been properly connected? Verify that the colored edge of the cable is connected to pin 1 on the edge connectors of both the card and cable.
- Call the drive manufacturer if the above steps don’t fix the problem.

Keyboard Problems

Because keyboards are relatively inexpensive, the most common solution to a keyboard problem is to replace it. However, there are a few simple things you can do to repair a keyboard that is not working.

A few keys don’t work

- Remove the cap on the bad key with a chip extractor. Spray contact cleaner into the key well. Repeatedly depress the contact in order to clear it out. Don’t use rubbing alcohol to clean the key well, because it can add a residue to the contact.
- If this method of cleaning solves the problem, then clean the adjacent keys as well.

The keyboard does not work at all

- Is the cable plugged in securely?

- If the cable connection is good and the keyboard still does not work, connect a working keyboard of the same type to the computer. If the second keyboard works, you have verified that the problem is in the keyboard and not in the computer.
- If the second keyboard does not work, connect the first keyboard to a computer that works properly. If this works, then the problem must be with the original computer.
- If the problem is in the keyboard, if possible, swap the existing cable with a cable known to be good, perhaps from an old, discarded keyboard. Sometimes a wire in a PC keyboard cable becomes pinched or broken. Most cables can be easily separated and detached from the keyboard by removing the few screws that hold the keyboard case together, then simply unplugging the cable. Be careful as you work; don't allow the key caps to fall out!
- If the problem is not the cable, replace the keyboard.
- If the problem is with the computer, consider the following: On the system board, the two chips that affect the keyboard functions are the keyboard chip and the ROM BIOS chip. You might choose to swap each of these chips on the system board. Otherwise the entire system board may have to be replaced.

Key continues to repeat after being released

- The problem may be a dirty contact. Some debris has conductive properties and can therefore short the gap between the contacts, causing the key to repeat. Try cleaning the key switch with contact cleaner.
- Very high humidity and excess moisture may short key switch contacts and cause keys to repeat. The problem will usually resolve itself once the humidity level returns to normal. You can hasten the drying process by using a fan (not a hot hair dryer) to blow air at the keyboard.

Keys produce the wrong characters

This problem is usually caused by a bad chip on the keyboard. Try swapping the keyboard for one you know is good. If the problem goes away, replace the original keyboard with a new one.

Major spills on the keyboard

For major spills on the keyboard, unplug the keyboard and thoroughly rinse it in running water. Give the board about two days to dry. You can speed up the process if you set it out in the sun or in front of a fan.

Monitor Problems

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Don't open the monitor case unless you are trained to work inside the case.

Poor cable connections or bad contrast/brightness adjustments cause many monitor problems. Below is a list of some common monitor problems and how to address them.

Power light (LED) does not go on, no picture

- Is the monitor plugged in?
- Verify that the wall outlet works by plugging in a lamp, radio, or other device.
- If the monitor power cord is plugged into a power strip or surge protector, verify that the power strip is turned on, and the monitor is also turned on.
- If the monitor power cord is plugged into the back of the computer, verify that the connection is tight, and that the computer is turned on.
- Check for a fuse in the monitor. If one is present, it should be visible from the back of the monitor. Look for a black knob that you can remove (no need to go inside the monitor cover). Check the fuse for a broken wire indicating a bad fuse.
- Check for a switch on the back of the monitor for choosing between 110 volts and 220 volts. Check that the switch is in the correct position.
- If none of these things works, take the monitor to a service center.

Power LED light is on, no picture on power up

- Check the contrast adjustment. If there's no change, then leave it at a middle setting.
- Check the brightness adjustment. If there's no change, then leave it at a middle setting.
- Is the cable connected securely to the computer?
- If the monitor-to-computer cable detaches from the monitor, exchange it for a cable you know is good, or check the cable for continuity (Chapter 11).
- If this solves the problem, reattach the old cable to verify that the problem was not simply a bad connection.
- Confirm that the proper system configuration has been set up. Some older system boards have a jumper or DIP switch that can be used to select the monitor type.
- Test the monitor that isn't working on a computer that works with another monitor.
- Test a monitor you know is good on the computer you suspect to be bad. If you think the monitor is bad, make sure that it also fails to work on a good computer.

- Check the software configuration on the computer. For Windows 9x, boot into Safe Mode, which forces the OS to use a generic video driver and low resolution. If this works, then change the driver and resolution.
- Test the video card you think is bad on a computer that works. Test a video card you know is good on the computer that you suspect may be bad. Whenever possible, try to do both. If the card you think is bad works on a computer you know is good, then the card is good. If the card doesn't work on either machine, you have probably found the source of your problem.
- If the video card has some socketed chips that appear dirty or corroded, consider removing them and trying to clean the pins. You can use a clean pencil eraser to do this. But normally, if the problem is a bad video card, the most cost-effective measure is to replace the card.
- Go into Setup and disable the shadowing of video ROM.
- Use Nuts & Bolts Discover Pro to test the RAM on the system board.
- Trade the system board for one you know is good. Sometimes, though rarely, a peripheral chip on the system board of the computer causes the problem.

Power on, but monitor displays the wrong characters

- Wrong characters are usually not the result of a bad monitor, but a problem with the video card. Trade the video card for one you know is good.
- If the new video card doesn't work, exchange the system board. Sometimes a bad chip, ROM, or RAM on the system board will display the wrong characters on the monitor.

Monitor flickers and/or has wavy lines

- Check the cable. Monitor flicker can be caused by poor cable connections.
- Does the monitor have a degauss button to eliminate accumulated or stray magnetic fields? If so, press it.
- Check if something in the office is providing a lot of electrical noise. For example, you may be able to stop a flicker by moving the office fan to a different outlet. Bad fluorescent lights or large speakers have also been known to cause interference. Two monitors placed very closely together may also cause problems.
- If the vertical scan frequency (the refresh rate at which the screen is drawn) is below 60 Hz, a screen flicker may appear in the normal course of operation.
- Try using a different refresh rate if your monitor supports it. In Windows 9x, right-click on the desktop and select Properties from the menu.
- Try a different monitor set in the same location. Does the same thing happen to the new monitor? If so, suspect interference.

- Check Control Panel, Display, Settings to see if a high resolution (greater than 800 × 600 with more than 256 colors) is selected. Consider these issues:
 - The video card may not support this resolution/color setting.
 - There may not be enough video RAM; 2 MB or more may be required.
 - The monitor may not support this resolution or refresh rate.
 - The added (socketed) video RAM may be of a different speed than the soldered memory.

No graphics display, or the screen goes blank when loading certain programs

- A special graphics or video accelerator card is defective or not present.
- The software is not configured to do graphics, or the software does not recognize the installed graphics card.
- The video card may not support this resolution and/or color setting.
- There may not be enough video RAM; 2MB or more may be required.
- The added (socketed) video RAM may be of a different speed than the soldered memory.
- The wrong adapter/display type may be selected. Start Windows 9x from Safe Mode to reset display. (“How to” is covered in Chapter 12.)

Screen goes blank 30 seconds or one minute after you last touched the keyboard

- A “green” system board (which follows energy-saving standards) used with an Energy Star monitor can be configured to go into a Standby or Doze mode after a period of inactivity.
- Try to change the doze features in CMOS, using a menu option such as Power Management, or in Windows 9x, using Control Panel, Display, Screen Saver.
- Some monitors have a Power Save switch on the back of the monitor. This may not be switched to your desired setting.

Poor quality color display

- Read the documentation for the monitor for explanations of the color-adjusting buttons on the outside of the monitor, which are used to fine-tune the color.
- Exchange video cards.
- Add more video RAM; 2, 4, or 8 MB may be required for higher resolutions.
- Check if there is a fan or large speaker (which has large magnets) or another monitor nearby that may be causing interference.
- Less expensive monitors and video cards don’t use quality components, which can cause perceived degradation. Try a quality monitor to determine if the image is affected.

A+^{CORE}
2.1

Picture out of focus, or out of adjustment

- Check the adjustment knobs on the control panel on the outside of the monitor.
- Change the refresh rate. Sometimes this can make the picture appear more in focus.
- There are adjustments that can be made inside the monitor that may solve the problem. If you have not been trained to work inside the monitor, take the monitor to a service center for adjustments.

Crackling sound

An accumulation of dirt or dust inside the unit may cause a crackling sound. Someone trained to work on the inside of the monitor can vacuum the inside.

E

Printer Problems

A+^{CORE}
5.2

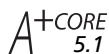
When troubleshooting printer problems, first determine that the problem is truly with the printer. The problem may be the computer hardware communicating with the printer, the applications software using the printer, the printer driver, the printer cable, or the printer. Ask these questions and try these approaches:

- Is the printer turned on, and is the printer online?
- Is the correct printer selected as the default printer?
- Will the printer work with an application program other than the one currently running? If so, then suspect the currently-running application to be the problem.
- Is the printer using the correct driver? Does the driver need updating? Is the driver correctly installed?
- Is there enough available hard drive space for the software to create temporary print files?
- Can you move the printer to another computer and print from it? Will another printer work on this computer? Answering these two questions can isolate the problem to either the printer or the computer.

After you are convinced that the problem is not with the computer hardware or software, but is indeed a problem with the printer itself, you are ready for the following troubleshooting guide. Also see the printer documentation for troubleshooting steps to solve printer problems.

Laser printer problems

The printer documentation can be very helpful and most often contains a phone number for technical support from the printer manufacturer. A good test for a printer is to print a test page from the PC, not just directly from the printer. From Windows 9x, access **Control Panel** and double-click on **Printers**. Right-click on the printer you want to test. Select the **Properties** options. Click on **Print Test Page** to send a test page to the printer.



Printer never leaves warm-up mode

The warming up message should disappear as soon as the printer establishes communication with the PC. If it doesn't, try the following:

- Turn the printer off and disconnect the cable to the computer.
- Turn on the printer. If it now displays a Ready message, the problem is communication between the printer and the computer.
- Verify that the cable is connected to the correct printer port, not to a serial port.
- Verify that data to the installed printer is being sent to the parallel port. For example, access the Properties box of the installed printer as described above. Verify that the print job is being sent to LPT1.
- Replace the cable.

A Paper Out message displays

- Remove the paper tray. Be sure there is paper in the tray. Carefully replace the tray, being certain that the tray is fully inserted in the slot.
- Check the lever mechanism that falls into a slot on the tray when no paper is present. Is it jammed or bent?
- Turn the printer off and back on.

A Toner Low message displays, or print is irregular or light

- Remove the toner cartridge from the printer, shake the cartridge from left to right to redistribute the toner supply evenly over the bottom of the bin, and replace it in the printer. To avoid flying toner, don't shake the cartridge too hard. This is really just a temporary fix for a cartridge low on toner. Plan to replace the toner cartridge in the printer soon.
- Extreme humidity may cause the toner to clump in the cartridge and give the same error message.

A Paper Jam message displays

- If paper is jammed inside the printer, follow the directions in the printer documentation to remove the paper. Don't jerk the paper from the printer mechanism, but pull it out carefully and evenly. Check for paper jams coming from the input tray and going to the output bin.
- If there is no jammed paper, then remove the tray and check the metal plate at the bottom of the tray. Can it move up and down freely? If not, replace the tray with a new tray.
- When you insert the tray in the printer, does the printer lift the plate as the tray is inserted? If not, the lift mechanism may need repairing.

One or more white streaks appear in the print

- Remove the toner cartridge, tap it to redistribute the toner supply, and replace the cartridge.
- Check the printer manual for specific directions as to what part may need replacing when this problem occurs.

Print appears speckled

- Try replacing the cartridge. If the problem continues, the power supply assembly may be damaged.

Printed images are distorted

- Check for debris that might be interfering with the printer operation.
- Replace the toner cartridge.

Dot matrix printer problems

A number of problems can arise with dot matrix printers.

Print quality is poor

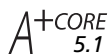
- Begin with the ribbon. Does it advance normally while the carriage moves back and forth? Is it placed correctly in the ribbon guide? Replace the ribbon.
- If the new ribbon still does not advance properly, check the printer's advance mechanism.
- Adjust the print head spacing. There is usually a lever adjustment that can alter the distance between the print head and the plate.
- Check the print head for dirt. Make sure it's not hot before you touch it. If there is a build-up, wipe off each wire with a cotton swab dipped in alcohol or contact cleaner.

Printer self-test works, but printing from a computer application program does not work

- To perform a printer self-test, see the printer documentation. If this test indicates that the printer itself is functioning correctly, communication from the PC may be the problem.
- Check cable connections. Is the printer online?

Print head moves back and forth, but nothing prints

- Check the ribbon. Is it installed correctly between the plate and the print head?
- Does the ribbon advance properly?
- Try a new ribbon.



Ink-jet printer problems

A number of problems can arise with ink-jet printers.

Print quality is poor

- The paper being used should be specifically designed for ink-jet printers.
- Is the ink supply low, or is there a partially clogged nozzle? (This may happen if the printer has been idle for several days.) If so, follow the printer's documentation to clean each nozzle.
- Remove and reinstall each cartridge.
- Change the print quality selection for the printer. (Use the Printer Properties window.)
- Is the print head too close to, or too far from, the paper?
- If you are printing on transparencies, try changing the fill pattern in your application.

Printing is intermittent or absent

- Make sure the correct printer driver is installed.
- Is the ink supply low?
- Are nozzles clogged?
- Replace the ink cartridges or replenish the ink supply. Follow the directions in the printer documentation.

Network Printer Problems

First determine that the problem is not a physical problem with the printer. Problems with network printing may be caused by the printer, the network, or the computer trying to use the printer. You can isolate the problem by finding the answers to the following questions:

- Is the printer online?
- Is the network printer on the remote PC configured correctly? Try uninstalling and reinstalling the printer.
- Is the correct network printer selected on the remote PC?
- Is there enough hard disk space available on the remote PC?
- Can you print successfully from another application on the remote PC?
- Can you print successfully from the host PC using the identical application?
- If you print to a file and then send the file to the host PC, does it print successfully? If this works, then the problem is with data transmission to the network printer. If this does not work, then the problem is with the application or print driver on the remote PC.

- For DOS applications, you may need to exit the application before printing will work. Is the network printer configured to handle DOS printing?

Modem Problems

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The text below describes how to address modem problems you may encounter.

The modem does not respond

To address this problem, answer the following questions and try the following approaches:

- Make sure the modem is plugged into the phone jack.
- If you are using an external modem, make sure it is plugged into the computer and that the connection is solid.
- There are two jacks on a modem. Are the lines reversed?
- Is the phone line working? Plug in a phone. Is there a dial tone?
- Do you need to dial an extra character (such as 9 or 8) to get an outside line?
- Has the modem ever worked, or is this a new installation? If it is a new installation, check the following:
 - Is the computer short on RAM or hard drive space? Try closing all other applications currently running.
 - Is the modem set to the same COM port and IRQ that the software is set to?
 - Is another device also configured to the same COM port or IRQ that the modem is using?
 - For an internal modem, check the DIP switches and jumpers. Do they agree with the modem properties in the OS?
 - Try moving an internal modem to a different expansion slot. For an external modem using a serial port card, move the serial port card to a different slot.
 - For an external modem, use a different serial cable.
 - Did the software correctly initialize the modem? If you did not give the correct modem type to the software, it may be trying to send the wrong initialization command. Try AT&F (Under Windows 9x, click **Start, Settings, Control Panel**. Double-click **Modem**. Select the modem and click **Modem Properties, Connections, Advanced Connection Settings**. Enter the **AT** command under Extra Settings.) Retry the modem.

The modem says that there is no dial tone, even though you can hear it

- The modem may not be able to detect the dial tone, even if you can hear it. Try unplugging any other equipment plugged into this same phone line, such as a Fax machine.
- Try giving the ATX0 command before you dial. Enter the command under Advanced Settings, as described above.

- Straighten your phone lines! Don't let them get all crossed and twisted up with other heavy electrical lines.

The modem dials and then says that the other end is busy, even when you know that it is not

- This can happen with international calls; the modem does not recognize the signal as a ring. Using communications software that allows you to enter AT commands (such as ProCom Plus), try entering the ATX0 command before entering the command to dial.
- Straighten the phone lines and remove extra equipment, as described above.

The modem and the receiving modem take a very long time to negotiate the connection

- This is probably due to a noisy phone line. Try calling again or using a different number.
- Remove other equipment from your line. A likely suspect is a credit card machine.
- Turn off data compression and try again.
- Turn off error correction and try again.
- Try forcing your modem to use a slower speed.

During a connection, it sounds as if the handshaking starts all over again

- Modems normally do this if the phone line is noisy and causes a lot of data to get corrupted; it's called **retraining**, and sometimes it can solve the problem as the modems renegotiate, compensating for the noisy line. Do the things listed above to clear your line of equipment and twisted phone lines.

File transfers are too slow

- Does your modem support data compression? Check that the modem is configured for it.

The modem loses connection at odd times or is slow

- Check the communications software for the speed assigned to the modem. Many times people set the communications software speed for the modem speed instead of for the port speed, which is what the software is asking for. (It should be about four times the modem speed.)
- You may have a noisy phone line. Try the connection using modems of the same brand and model on both ends. If performance is better, the problem is most likely the phone line, because two modems of the same brand and model are best able to compensate for a noisy phone line.
- Is the phone line from the modem to the jack too long? About 4 feet is the upper limit; otherwise, electromagnetic interference may be the problem.

- Straighten the phone lines and clear the line of any extra equipment.
- Reinstall the modem. Allow Windows 9x to detect the modem for you and install its own drivers.
- Search the Web site of the modem manufacturer for a new driver and install that.

The modem drops the connection and gives the NO CARRIER message

- Most likely the connection was first dropped by the remote modem. Is someone trying to use a phone extension on this line?
- Disable call waiting. Some communications software has a setting to disable call waiting. If not, you can put *70 in the Extra Settings box of Advanced Connections Settings.
- Remove extra equipment from the line and straighten the phone lines.

When the weather is bad, the connection often disconnects

- This is caused by a dirty phone line. Does your line make extra noises at these times? Remove any extra equipment and straighten the lines.

Whenever large files are downloaded, some of the data is lost

- Make sure that hardware flow control is on and that software flow control is off, for the software, the COM port, and the modem.

The connection fails whenever large files are uploaded or downloaded

- There may be a buffer overflow. Try these approaches to gain better control of data flow:
 - Make sure that hardware flow control is on and that software flow control is off, for the software, the COM port, and the modem.
 - Is the serial port speed set too high for the UART chip you have? Lower the port speed.
 - For an external modem, try a different serial port cable.

You get nothing but garbage across the connection

- Check the port settings. Try 8 databits, no parity, and one stop bit (8, No, and 1).
- Slow down the port speed.
- Slow down the modem speed.

CD-ROM Drive Problems

Problems with the CD-ROM can arise in a number of different settings.

Problems when installing the CD-ROM drive

Real-mode CD-ROM drivers can be loaded from the AUTOEXEC.BAT and CONFIG.SYS files. See the CD-ROM installation guide for specific commands for your drive. Here are two examples:

In the CONFIG.SYS file: `DEVICE=C:\CDSYS\SLCD.SYS /D:MSCD001`

In AUTOEXEC.BAT: `C:\DOS\MSCDEX.EXE /D:MSCD001 /L:D /M:8`

Try creating a bootable disk with these commands and the referenced files. (Modify the paths to point to drive A.)

The error message (Invalid Drive Specification) appears while the system is trying to access the drive

- Does the eject button work on the drive? If not, then check the power connection to the drive.
- Check that there are no errors in the command lines in the CONFIG.SYS or AUTOEXEC.BAT file, according to the documentation that came with the CD-ROM. Did you get an error message during booting, such as Bad Command or File Not Found?
- If an adapter card is used, reseal it and check cable connections.
- The MSCDEX.EXE program may not be loaded. The entry in AUTOEXEC.BAT needs to come before the command to load Windows.
- Try a different version of MSCDEX. Look for this file in the \DOS directory and change the path in front of the filename in AUTOEXEC.BAT to point to that version.
- Reinstall the drivers. Check the Web site of the drive manufacturer for updated driver files.

The install process is terminated with the message “MSCDEX.EXE not found”

- For DOS and Windows 3.x, MSCDEX.EXE must be copied onto the hard drive. Put it in the \DOS directory, then restart the install process. Sometimes MSCDEX is placed in the Windows directory, and sometimes a copy is put in the newly created CD-ROM directory.

The error message “Not Enough Drive Letters” appears during booting

- Increase the number of allowed drive letters with the LASTDRIVE line in CONFIG.SYS:
`LASTDRIVE=Z`

Conflict errors exist

- These will appear during booting as error messages, or they will cause some other device to fail to operate. The IRQ and the I/O address of your CD-ROM

should be in the documentation. If not, call the manufacturer's technical support for this information or check the manufacturer's Web site.

- For Windows 9x, see Device Manager for resources used. Search Device Manager for resource conflicts.

Computer does not recognize CD-ROM (no D: prompt in DOS or no drive D listed in Windows 9x Explorer)

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- Check the following configurations:
 - When using DOS, does the CONFIG.SYS file contain a CD device command line? Does the AUTOEXEC.BAT file call MSCDEX.EXE? Is MSCDEX.EXE placed in the correct directory? (A correct Windows 9x installation will not need MSCDEX.EXE or entries in AUTOEXEC.BAT or CONFIG.SYS.)
 - For Windows 9x, has the CD-ROM driver been installed? Look in Device Manager.
 - Check to see if another device is using the same port settings or IRQ number. Look in Device Manager.
- Check the following connections:
 - Is the power cable attached to the CD-ROM?
 - Is the data cable attached to the CD-ROM and to the controller?
 - Is the stripe on the data cable correctly aligned to pin 1? (Look for an arrow or small 1 printed on the drive. For a best guess, pin 1 is usually next to the power connector.)
 - For IDE drives, is the correct master/slave jumper set? For example, if both the hard drive and the CD-ROM drive are hooked up to the same ribbon cable, one must be designated master and the other slave.
 - For IDE drives, verify the IDE connection is enabled in CMOS setup.
 - For SCSI drives, is the proper ID set and the device terminated if it's on the end of the SCSI chain?
- Suspect a boot virus. Run a current version of an antivirus program.

No sound

- Is the sound cable attached between the CD-ROM and the analog audio connector on the sound card?
- Are the speakers turned on?
- Make sure the speaker volume is turned up. (Check both the speaker itself and the OS volume control.)
- Make sure the speakers are plugged into the line "Out" or "Spkr" port of the sound card.

- Is the transformer for the speaker plugged into an electrical outlet on one end and into the speakers on the other end?
- Is the volume control for Windows turned down? (To check, click **Start, Programs, Accessories, Entertainment, Volume Control**.)
- Does the sound card have a “diagnose” file on the installation floppy disk?
- Reinstall the sound card drivers.
- Is another device using the same I/O address or IRQ number? Look in Device Manager.
- To check for a bad connection, remove and reinstall the sound card.
- Replace the sound card with one you know is good.

Backup Tape Drive Problems

There are a number of different tape drives that may cause different types of problems.

A minicartridge does not work

- Verify that the minicartridge is write-enabled if you are trying to write data.
- Are you inserting the minicartridge correctly? Check the user guide.
- Check that you are using the correct type of minicartridge. See the user guide.
- Is the minicartridge formatted? The format is done by the software and can take an hour or more.
- Retension the tape. Use the backup software to do this. Some tape drives require this, and others do not. Retension fast-forwards and rewinds the tape to eliminate loose spots.
- Take the minicartridge out and reboot. Try the minicartridge again.
- Try using a new minicartridge. The old one may have worn out.
- Just as with floppy disks, if the tape was removed from the drive while the drive light was still on, the data being written at that time may not be readable.

Data transfer is slow

- Does the tape software have an option for optimizing speed or data compression? Try turning one and then the other off and on.
- Some tape drives can use an optional accelerator card to speed up data transfer. See the tape drive user guide.
- Try a new minicartridge.
- If the tape drive can do so, completely erase the tape and reformat it. Be sure that the tape drive has the ability to perform this procedure before you tell the software to do so.

- If you have installed an accelerator card, verify that the card is connected to the tape drive.
- Check that there is enough memory for the software to run.

The drive does not work after the installation

- Check that pin 1 is oriented correctly to the data cable at both ends.
- Check for a resource conflict. The tape drive normally requires an IRQ, DMA channel, and I/O address.
- For DOS, check the entries in CONFIG.SYS and AUTOEXEC.BAT.

The drive fails intermittently or generates errors

- The tape might be worn out. Try a new tape.
- Clean the read/write head of the tape drive. See the tape drive user guide for directions.
- For an external tape drive, move the drive as far as you can from the monitor and computer case.
- Reformat the tape.
- Retension the tape.
- Verify that you are using the correct tape type and tape format.

Problems That Interrupt a Windows 9x Installation

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- Setup is probably having trouble detecting the hardware present. Begin the installation again. Setup might recover from the error and continue normally.
- Another possibility is a virus. Run a virus scan program on the hard drive from the DOS prompt.
- The existing version of Windows might have corrupted system files. To eliminate using the existing version of Windows early in the installation, use this command to run Setup: Setup /D.
- To watch for errors during the installation that can be caused when ScanDisk runs, use this command to run ScanDisk in the foreground: Setup /IH.

Software Installation Problems

A⁺ OS
3.2

A number of different problems can arise during software installation.

Setup continues to ask for the same installation disk

Remove the disk from the floppy drive and verify that you have the correct disk. Open and close the shuttle window several times, and try the disk again. The disk may be defective.

A⁺ OS
3.2**You don't have enough hard drive space for the installation**

- Erase lost clusters and defragment the drive before the installation.
- Look for temporary files or applications software that you no longer use, and delete them.
- Run a Custom Setup that allows you to install only some of the application.

The problem is unknown; the software just does not work after the installation

- Wrong configuration information may have been given to the installation program. If you suspect that this is the problem, begin again, giving the correct information.
- Try reinstalling the software, and carefully watch for error messages. Before you begin again, use the uninstall program that comes with the software to completely uninstall the software. If you suspect the uninstall utility is not working properly, restore the Windows registry to its state before the installation.
- If there is no uninstall program, use a third-party uninstaller, or erase all files in directories on the hard drive created by the installation program, remove the directories it created, and restore the Windows registry to its state before the installation.
- For legacy software, look in AUTOEXEC.BAT and CONFIG.SYS files for errors. Restore the original AUTOEXEC.BAT, CONFIG.SYS, Win.ini, Progman.ini, and System.ini files, and begin again, at the beginning of the installation process.
- Try to execute some portion of the software, such as the Help utility. Look for information about installation requirements. Consult your documentation and technical support for the software.
- After the installation is complete and the software is working, update your backup copies of AUTOEXEC.BAT, CONFIG.SYS, System.ini, Win.ini, and the Windows registry so that they, too, reflect the changes the applications software made to these configuration files.

Hardware Device Installation Problems Under Windows 9x

Hardware installation problems under Windows 9x arise in a number of different settings.

The device is not in the list of supported devices

When Windows 9x cannot identify a new hardware device, you can select the device from the list of devices supported by the OS. If your device is not in the list, provide a device driver from the manufacturer (click Have Disk), or use a Windows 9x substitute (see the device documentation for a recommendation). When possible, use the manufacturer's driver rather than a Windows 9x driver.

A⁺ OS 2.1 Windows 9x cannot use a 16-bit driver

- Contact the manufacturer of the device for an updated driver, or ask the manufacturer to recommend a substitute driver.
- If the 16-bit device driver has an install program, run the install program under either DOS or Windows 3.x, depending on what the install program requires. It makes the correct entries in the AUTOEXEC.BAT and CONFIG.SYS files and copies the driver files to the hard drive. You should then be able to install the device in Windows 9x with no problems.

Problems installing a legacy card (not Plug and Play)

- Problems installing a legacy card under Windows 9x are generally caused by resource conflicts with other legacy cards.
- See Device Manager for the resources being used by other legacy cards already installed.
- Change the jumpers or DIP switches on one of the devices to force it to use a different resource.
- Disable PCI bus IRQ steering (see Chapter 9 for more information).

Windows NT Boot Problems

A⁺ OS 2.2 A number of problems can arise when booting Windows NT.

Errors display during the boot process

- A⁺ OS 2.2**
- Don't attempt to log on. Reboot and select the Last Known Good configuration at bootup.
 - Use antivirus software to scan for viruses.
 - If the active partition is FAT, boot from a floppy disk and run Scandisk to check for surface errors.

Windows NT will not boot

Boot using the three Windows NT boot disks. Have the Windows NT emergency repair disk available. When the Start menu displays, select all options for repair and execute the menu. Follow the directions on the screen. You may be asked to provide the original Windows NT CD-ROM or a previously prepared Windows NT emergency repair disk.

Windows 2000 Boot Problems

What to do when solving problems booting Windows 2000 Professional depend on at what point in the boot process the problem occurs. Try these things in this order to recover from a failed boot:

- Boot into Safe Mode and run antivirus software.

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2.1

- Boot to the Advanced Options Menu (press F8 during booting) and select the Last Known Good Configuration to restore the registry to its state during the last successful boot.
- If you have other backups of the registry, try restoring the registry from these backups.
- Boot from the Windows 2000 CD or from the four Windows 2000 Setup disks. From the Windows Setup menu select “To repair a Windows 2000 installation.” The Windows 2000 Repair Options window opens. Type C to select the Recovery Console. Use the Recovery Console to restore the Registry to its state at the end of the installation process.
- Use the Emergency Rescue Disk to fully recover the system to its state at the completion of the installation.
- Reinstall Windows 2000

Network Problems

Network problems can arise in a variety of settings.

Windows 9x dial-up problems

Problems encountered when dialing into a host computer using Windows 9x Dial-Up Networking may be caused by the modem. See the troubleshooting guidelines for modems, above, to eliminate the modem as the source of the problem.

Cannot make a connection

Because Dial-Up Networking involves so many different components, first find out what works and what doesn't work. Find out the answers to these questions:

- Does the modem work? Compare the printout of a Modemlog.txt file that was made during a successful connection from another PC to the Modemlog.txt file generated when trying to connect from this PC, to identify at what point in the connection an error occurs. (For Windows 9x to log modem events to the Modemlog.txt file, double-click on **Modems** in Control Panel, and then select the modem, click **Properties, Connection, Advanced**, and turn on **Recording to a log file**.)
- Are all components installed? Check for the Dial-Up Adapter and TCP/IP, and check the configuration of each.
- Check the Dial-Up Networking connection icon for errors. Is the phone number correct? Does the number need to include a 9 for you to get an outside line? Has a 1 been added in front of the number by mistake?
- Reboot your PC and try again.
- Try removing and reinstalling each network component. Begin with TCP/IP.
- Try dialing the number manually from a phone. Do you hear beeps on the other end?

- Try another phone number.
- Sometimes older copies of the Windows socket DLL may be interfering with the current Windows 9x version. (Windows 9x may be finding and executing the older DLL before it finds the newer one.) Search for and rename any files named Winsock.dll except the one in the Windows\System directory.

You can connect, but you get the message, “Unable to resolve hostname...”

This means that TCP/IP is not able to determine how to route a request to a host. Right-click on the **Dial-Up Networking** connection icon, select **Properties**, and check for these things:

- Under Server Type, is TCP/IP the only network protocol allowed?
- Under TCP/IP settings, check the IP addresses of the DNS servers.
- Is **Using the default gateway** selected?
- Try *not* selecting IP header compression.

After connection, you get the error: “Unable to establish a compatible set of network protocols”

- The error is most likely to be caused by a problem with the installation and configuration of Dial-Up Networking and/or TCP/IP. Try these approaches:
- Verify that Dial-Up Adapter and TCP/IP are installed and configured correctly.
- Remove and reinstall TCP/IP. Be sure to reboot after the installation.
- Try putting the PCs in different workgroups. Sometimes problems arise when two PCs using Windows 9x are in the same workgroup.
- Windows 9x can write the events of PPP processing a call to a log file. Create the PPPLog.txt file on a PC that makes a successful connection, and compare it to the log file of your bad connection. You might be able to see exactly when the problem began. To turn on **Logging events to the file**, double-click the **Network** icon in **Control Panel**. Click **Dial-Up Adapter**, click **Properties**, select the **Advanced** tab, and select **Record a log file**. On the Value list, click **Yes**, and then click **OK**. Reboot the PC. The file PPPLog.txt is created in the Windows folder as the connection is made and used.

When you double-click on the network browser, the modem does not dial automatically

Right-click on the network browser icon and select **Properties** from the drop-down menu. Under the Connection tab, check **Connect to the Internet as needed**.

Problems with TCP/IP Under Windows 9x, Windows NT, or Windows 2000

- For Windows 2000 or Windows NT, at the command prompt, enter **IPCONFIG**, or, for Windows 9x, from a Run dialog box enter **WinIPcfg** and click **OK**. If the TCP/IP configuration is correct, then for static IP addressing, the IP address, subnet mask, and default gateway will be displayed, along with the adapter address. If DHCP is used for dynamic IP addressing and the PC is unable to connect with the DHCP server, then the IP address might read 0.0.0.0, or for automatic IP configuration, the IP address will have the form 169.254.x.x.
- Next try the loopback address test. Enter the command **PING 127.0.0.1**. If this works, most likely TCP/IP is configured correctly.
- If you have been assigned an IP address, **PING** it. If you get any errors up to this point, then assume that the problem is on your PC. Check the installation and configuration of each component. Remove and reinstall each component and watch for error messages. Compare the configuration to that of a PC that is working, on the same network.
- Next **PING** the IP address of your default gateway. If it does not respond, then the problem may be with the gateway or with the network to the gateway.
- Now try to **PING** the host computer you are trying to reach. If it does not respond, then the problem may be with the host computer or with the network to the computer.
- If you substitute a URL for the IP address in the **PING** command, and the **PING** works, then you can conclude that DNS works. If an IP address works, but the URL does not work, the problem lies with DNS. Try this: **PING Microsoft.com**.